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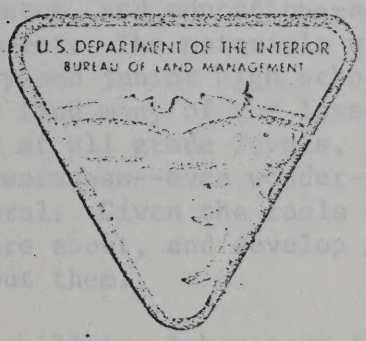
THE WHOLE OF ME

Written By: Martha Jenner
Richard Hutchison
William Tomlinson



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BUREAU OF LAND MANAGEMENT

October 1970

TO TEACHERS AND STUDENTS:

We in the Bureau of Land Management are heartened by the mounting concern students and their teachers have been demonstrating with regard to the protection and thoughtful development of our nation's lands and resources. All educational institutions can perform a valuable service by imparting, both to young people and to adults, knowledge and attitudes which will enable all of us to work together to improve the quality of life in this country.

The environmental education materials in this booklet were developed for BLM during Summer 1970 by six young people, schooled in physical sciences, social sciences, and education--and concerned about the future of our environment. The materials were prepared with students at the late elementary and junior high school grade levels in mind, but you will probably find many of the lesson suggestions appropriate for use or adaptation at all grade levels. We hope these ideas will help you develop an awareness--even wonder--for your own surroundings, be they urban or natural. Given the tools for discovery, we believe students can learn more about, and develop greater responsibility toward, the world about them.

All the BLM lands are a living laboratory for the study of land and resource management and protection. We are designating specific sites as part of the Department of the Interior's National Environmental Study Area program. We urge students and teachers to use the public lands as your own outdoor classrooms. We hope you will call on our District Office staff for assistance with your environmental education activities.

Sincerely yours,

Director

ACKNOWLEDGEMENTS

The Prineville Environmental Study Team wishes to thank all of those who encouraged and assisted us throughout the summer.

We wish to express our thanks to Linda Bemis in the Office of Program Planning, Bureau of Land Management, Washington D.C., for her continual support and aid; Archie Craft, State Director of the Bureau of Land Management, Portland, Oregon; and Bob Hostetter, Assistant to the State Director, Bureau of Land Management, Portland, Oregon, for the cooperation and advice he gave as project leader.

We gratefully acknowledge the assistance which the entire BLM staff in the Prineville District Office gave, with special recognition to Don Robins, the District Manager, and Andy Ryan, our project coordinator.

Our appreciation is also extended to Ernie McDonald, Information and Education Officer for the U. S. Forest Service, Region VI; Char McDonald, outdoor education specialist; Joe Mohan, District Ranger, Crooked River National Grasslands, U. S. Forest Service; George Otte, U. S. Soil Conservation Service; and Jay Gruenfeld, Brooks-Scanlon Inc., Bend, Oregon for the materials, suggestions, and time they contributed.

FOREWORD

To The Teacher:

"The Whole Of Me" is a guide to environmental studies which may be adapted to any age group. The problems the world faces today have made it imperative for people of all ages to understand their total environment and how each part of this environment is dependent upon every other part. Understanding is not achieved by merely reading about something. It only occurs when the student explores for himself what is around him and discovers how each thing relates in some way to his life. We have given no answers in the guide, only thought provoking questions to help you and your students become more aware of and sensitive to your environment.

The activities in "The Whole Of Me" begin in the classroom and move outside to the schoolyard, city, and rural areas. As they explore these areas, your students will discover many questions other than those proposed which will need investigating. Encourage these questions as this guide is designed for action. You will help your students better understand their total environment by actively involving them in what is going on outside the four walls of their classroom.

"The Whole Of Me" contains three sections based on an inter-disciplinary approach. Section I concentrates on creative activities directed toward helping students tune in to their surroundings. Section II is an overall view of the town your students live in or near. This consists of a town inventory including population, life support systems, and problems. References and resources for you and your students comprise Section III. The book is written as a student's guide with hints for the teacher on separate pages. This will enable you to photocopy those activities you wish to use and eliminate what does not apply to your teaching level.

The success of this book depends upon your willingness to guide and encourage the student toward a realization of his environmental role.

MJ
RH
WT

September 4, 1970
Prineville, Oregon

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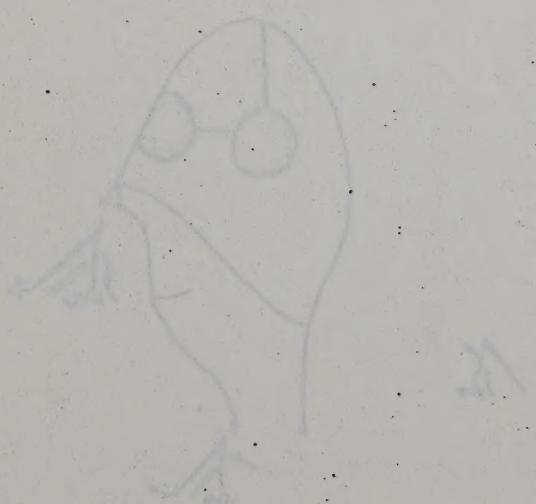

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Only that day dawns
to which we are awake.
Thoreau

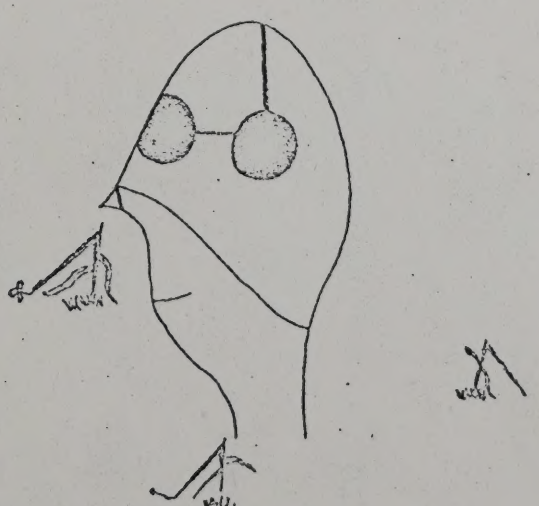
In the shadows about you, look and see, listen and hear, sniff and smell, taste and LIVE.

Most of us live half lives, lives of dead senses; the very senses which give us our quality of life, of living and of humanness.

Biologically, we exist; but the elements which support us are in danger. Conditions which we no longer even see have created this danger.

The balance between organisms and their environment is delicate and may easily be upset. As we remove parts of food chains and simplify portions of the complex web of life we set the stage for catastrophe.

Our survival depends upon how well we understand our total environment; how sensitive we are to it, and how well we live within its complex net of interaction.



SECTION I

HAVE YOU THANKED A
GREEN PLANT
YET TODAY

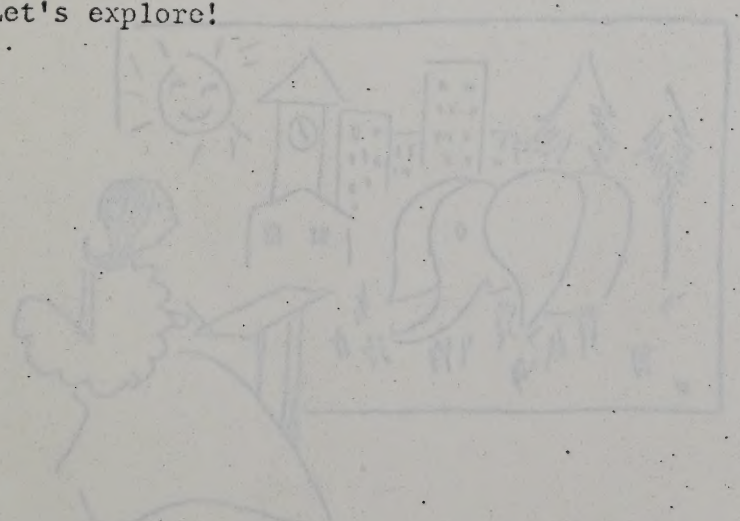
Did you see a green plant?

Did you see the grass growing in the sidewalk cracks?

Did you see the dandelion growing in the street next to the curb?

What things have you seen today? Do you remember anything about them? What were their colors? Did they make any noise? How did they smell, and taste?

Let's explore!



HAVE YOU THANKED A
GREEN PLANT
YET TODAY

AWARENESS -- YOUR ENVIRONMENT IS ALL AROUND YOU!

The exploration of your environment will begin here, wherever you are right now, which is probably in the classroom. All you really have to explore with is your senses.

SEEING

FEELING

SMELLING

LISTENING

TASTING

These are the tools you will use; they are all you need.

If you are like most people, your senses may need a little tuning up. They may need a lot of tuning up since today in our machine-age cities people rely less and less on their senses and more and more on machines for information about the world around them. They can go through life looking without ever seeing, touching without ever feeling, and listening without ever hearing. It is an easy, but dull existence.

Developing greater sensitivity can be fun. By using your senses to their fullest, you will become more aware of both yourself and your surroundings --- in other words, of your environment.

Start with that big blob of things you can see out the classroom window. Everything in the world is different and everything means something different to every person. Differences can be in color, texture, shape, smell or any other quality. Even though things are different there still are many ways in which they are alike.

What sort of things do you see out the window? Take some time and don't just look; try to really SEE!

Things I see:

You have used your eyes to notice some things outside the window. This is only a beginning. Your eyes can tell you more than just what objects are present. They can show you how things are alike, different, and how they are related. Let's investigate some of these relationships.

Are some of these things alike in some way? How are they alike? For example, are they the same color? size? texture?

Teacher: The important concepts of change and interaction are being introduced here. The environment is a constantly changing dynamic system. Like the movement of a clock's hour hand change may be imperceptible, but it is constantly occurring. Buildings are crumbling, mountains are being born, and people are growing older. Any interaction between two members or factors in the environment produces a change --- even if you and I are not here long enough to see it happen.

You might like to have your students take a fifteen or twenty minute walk around the neighborhood and record evidence of change. These changes may be taking place in both living and non-living objects, and some may be easier to see than others.

In what other ways might these things be alike? Think about what they do in your environment. What is their function?

In what ways are the things you have listed different?

Are any of these things changing in any way? If they are, how? What is causing these changes?

What Is Changing	How It Is Changing	Cause Of Change

Are there any objects on your list that look like they aren't changing? If there are, how do you think they will look in 10 years? 100 years? 1000 years?

Objects	10 Years	100 Years	1000 Years

From your list pick out your favorite thing. . .
Use one word to name what it is.
Can you use two words to describe it?
Three words about what it is doing?
Four words to describe how you feel about it?
One word which, to you, means the same as the first word?

For Example: walls

big small

fences stops divides

keep one from another

tall

adapted from a cinquain by
Mary from: Washington Education
March 1970

Your Favorite Thing:

_____

_____ _____

_____ _____ _____

_____ _____ _____ _____

_____

You just wrote a poem called a cinquain (sin-kane) about your favorite thing which you saw from the window.

Is there anything you saw from the window which you didn't like? What are some of the things you didn't like? Why not?

Write a cinquain about a thing you saw which you did not like. Compare it to the first cinquain you wrote.

_____

_____ _____

_____ _____ _____

_____ _____ _____ _____

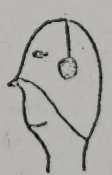
_____

If you could change some of the things you saw which you didn't like very well, what would you do to them and how would you go about doing it? What side effects would occur when you made these changes?

Changes I Would Make	Possible Side Effects

When we try to pick out anything
by itself, we find it hitched
to everything else in the
universe.

Muir



COLORS SOUNDS SMELLS

Colors, smells, and sounds are an exciting part of anyone's environment. They affect people's thoughts, emotions, and actions, and add diversity to what might otherwise be a very dull scene. We have suggested some activities and questions to help get this point across to students. The activities start with color indoors and move outdoors to work on all three sensations. Later on the perception of these three sensations from indoors will be compared to their perception out of doors.

COLORS, SMELLS, SOUNDS

COLORS . . .

Like acrobats on a high trapeze
The Colors pose and bend their knees
Twist and turn and leap and blend
Into shapes and feelings without end . . .

from: "Hailstones and Halibut Bones"
by: Mary O'Neill

Notice the colors of the things on your list which you didn't like very well. Compare these to the colors of the things you did like. Is there any difference? If so what is the difference?

What is your favorite color?_____. How does that color feel? How does it taste? How does it smell? How does it sound?

feel_____

taste_____

smell_____

sound_____

COLORS . . .

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The colors pose and bend their knees
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What is your favorite color?_____. How does that color feel? How does it taste? How does it smell? How does it sound?

feel _____

taste _____

smell _____

sound _____

List the things you observed from the window which are your favorite color.

Things My Favorite Color:

1.

2.

3.

4.

5.

LET'S GO OUTSIDE AND TAKE A CLOSER LOOK AT WHAT YOU HAVE BEEN OBSERVING AND THINKING ABOUT!

Take a good look at the natural objects around you. What colors are present in the natural objects you can see?

Natural Objects	Colors Present
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Compare these colors to the colors of the man-made objects, including clothing, you see. Where is the greatest variety found, in man or nature?

Where is your favorite color found most often, in man made objects or in natural objects?_____.
What purpose does the color serve in these objects?

What colors are the animals and birds that you see or have seen? What do these colors do for the animals or birds? Can you think of how colors help animals or birds survive?

Animal	Color	What The Color Does

Notice the advertising around you. What colors are present?

What role do colors play in advertising? For example, is a colored sign more appealing than one which is black and white?

Do colors affect and change you and your behavior? How? For example, think about how you would feel in an all black room. What do colors have to do with your choice of clothing?

Notice the advertising around you. What colors are present?

What role do colors play in advertising? For example, is a colored sign more appealing than one which is black and white?

Do colors affect and change you and your behavior? How? For example, think about how you would feel in an all black room. What do colors have to do with your choice of clothing?

The Colors live
Between black and white
In a land that we
Know best by sight.
But knowing best
Isn't everything,
For colors dance
And colors sing,
And colors laugh
And colors cry --
Turn off the light
And colors die,
And they make you feel
Every feeling there is
From the grumpiest grump
To the fizziest fizz.
And you and you and I
Know well
Each has a taste
And each has a smell
And each has a wonderful
Story to tell . . .

from: "Hailstones and Halibut Bone
by: Mary O'Neill

The Colors Jive

Between black and white

In a land that we

Know best by sight.

But knowing best

Isn't everything.

For colors dance

And colors sing.

And colors laugh

And colors cry --

Turn off the light

And colors die.

And they make you feel

Every feeling there is

From the happiest group

To the flattest flis.

And you and you and I

Know well

Each has a taste

And each has a smell

And each has a wonderful

Story to tell . . .

From: "Skeletons and Daffodil Bo
by: Mary O'Neill

SMELLS . . .

We have a bad habit of not using our senses to their capacity. The sense of smell is one we probably ignore the most. This is too bad since smells can tell you a lot about your surroundings.

Stop for a minute and use only your nose. Breathe deeply and take notice of everything your nose senses. List the different smells you can pick out. Where do they come from?

Smells	Where They Come From

Are some smells more pleasant than others? _____.
Which ones are they? Why do you like them better?

How often do you rely on your sense of smell? Think about what your sense of smell does for you in your everyday life. Give some examples of how you use your sense of smell.

Examples:

Would it be possible to develop your sense of smell so that it could do more for you? If you think it would be, how would you do it?

Imagine that you are living in a forested area in North America about four hundred years ago and that for your survival you depend on deer hunting. How important a role would your sense of smell play in your survival. Why?

Does this tell you anything about why your sense of smell isn't very acute? What?

Describe how it smells outside when the first rain after a dry period is just beginning to fall. Use a cinquain, sketch, story or anything else to make this description.

SOUNDS . . .

The sound of black is
"Boom! Boom! Boom!"
Echoing in
An empty room.

from: "Hailstones and Halibut Bones"
by: Mary O'Neill

Sounds are an exciting way to learn more about your surroundings. They can tell us a lot when we are aware of them, of where they come from, and of what they mean.

Listen for a moment . . . what sounds do you hear? What is the source of each sound?

Sound	Source

How are these sounds similar? How are they different?

For Example:

some are soft some are loud

Are some sounds more pleasant than others? Which ones are they and why do you like them better?

Stop and listen at different times during the day. Do you hear different sounds at certain times in the day? Where are they coming from? Why do you hear some sounds at one time during the day and not at another?

Are there any sounds that never stop? What are they? If they never stop why don't you hear them all the time?

Are some sounds more pleasant than others? Which ones
are they and why do you like them better?

Stop and listen at different times during the day. Do
you hear different sounds at certain times in the day?
Where are they coming from? Why do you hear some
sounds at one time during the day and not at another?

Are there any sounds that never stop? What are they?
If they never stop why don't you hear them all the time?

Listen again . . . What is the smallest sound you hear? Try describing this sound with a cinquain as you did earlier with your favorite thing.

_____

_____ _____

_____ _____ _____

. . . . . .

_____ _____ _____ _____

_____

The tiniest sound in the world
is a snowflake
as it
falls
from
the
sky
and
gently
turns
into
a
tear.

Can you imagine what the tiniest sounds in the world are? Describe what <u>you</u> think the tiniest sound is using a sketch, a poem, or any other way you wish.

Listen again . . . What is the smallest sound you hear?
Try describing this sound with a cinquain as you did
earlier with your favorite thing.

_____

_____ _____

_____ _____ _____

_____ _____ _____ _____

_____

The tiniest sound in the world
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Can you imagine what the tiniest sounds in the world are?
Describe what you think the tiniest sound is using a
sketch, a poem, or any other way you wish.

YOUR SENSES . . . USING THEM ALL AT ONCE

What is your very favorite place in the world?_____
Describe it using all of your senses trying this method for a start:

Use one word for color _____

Use two words for how the place feels _____

Use three words for how it sounds _____

Use two words for how it smells _____

Use one word for how it tastes _____

Make up your own ways of describing your favorite place. Use words, sketches, anything you wish. See if some of your classmates can figure out what your favorite place is just by looking at your description of it.

"I like this place because it is up high and it is comfortable. Across the street there is a big pipe. It makes a noise that sounds like music."

by Mark

from: "A Place I Like". Charline McDonald. Washington Education. March 1970

COMPARING

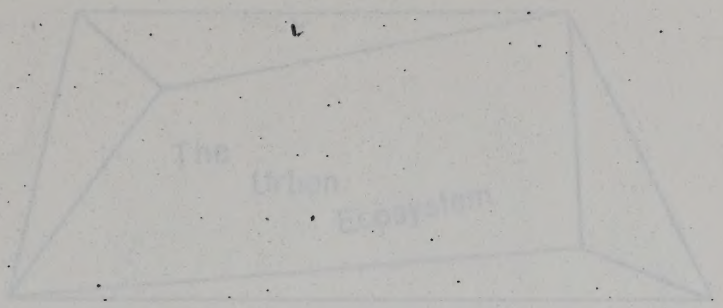
YOU HAVE DONE SOME WORK BOTH INSIDE AND OUTSIDE . . .

Did the things you observed from inside the classroom seem different when you looked at them outside? How were they different and why?

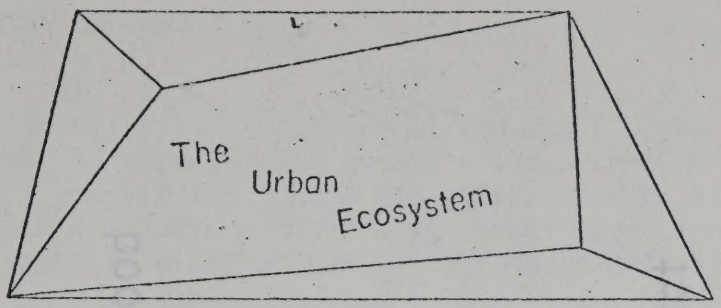
Do things mean more when you can use more of your senses to find out about them? Why?

"I discovered the secret of the sea
in meditation upon a dewdrop."
Kahlil Gibran

You have completed some activities made to help you see and understand the world around you. This is only a start; there is much more you can do on your own. Developing your senses takes time and some work, but it is worth it! What you will do on your own is even more important to you than what you have already done. As you continue with this guide, use your imagination and most of all, your senses.



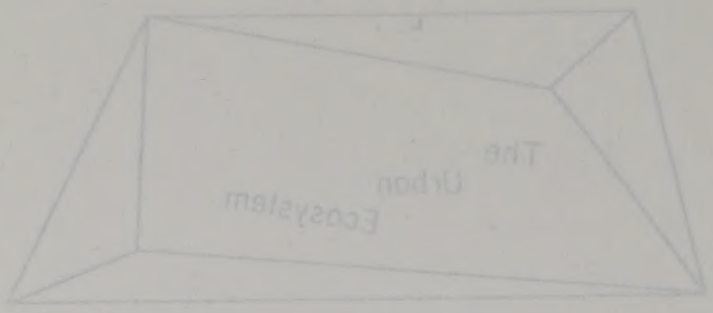
SECTION II



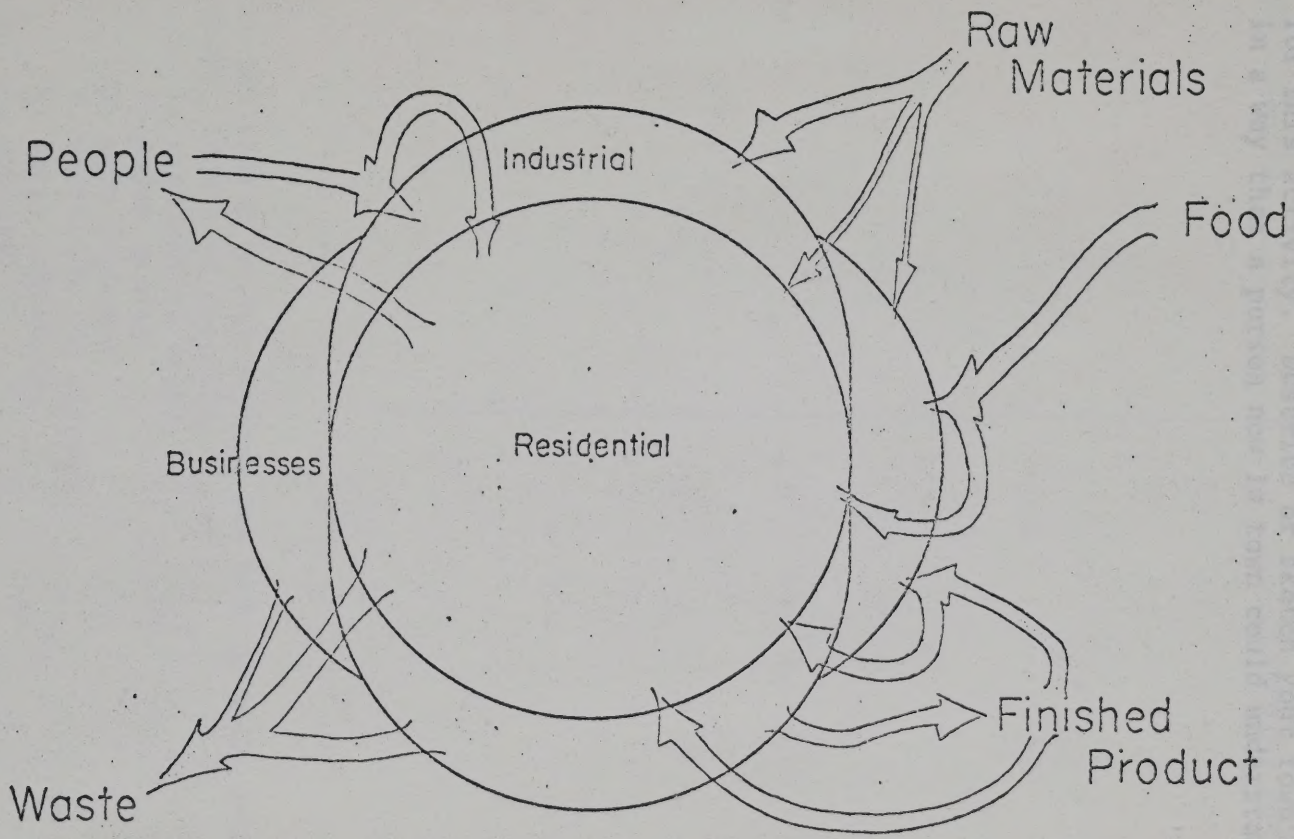
Most of us live in a town. Some are small towns; others are very large. Each has reasons for being what it is. Some were started because of ranching, others because of logging, others because of transportation. For some reason people were brought together. People of all types. People with different backgrounds. People with different goals. People living their lives in different ways.

How do you fit into your town?

How does your town affect your life and the rest of life in it and around it?



THE URBAN ECOSYSTEM



THE URBAN ECOSYSTEM

HOW IT GOT HERE AND WHY . . .

Describe or sketch the shape of your town. You may need to refer to maps if you live in a large town or if you haven't seen it all. Maps and atlases can be a big help for this activity. Describe or sketch your town's shape in a way that a person new in town could understand.

Why is your town shaped the way it is? As you investigate this question, record the natural and man-made features which cause this shape. Also, look into the history of your town area. What role did people play in influencing the shape of the town?

Man-made Features	Natural Features

In the sketch or description you made of your town's shape, locate or describe:

1. residential areas
2. major stores
3. main highways
4. railroads and airports
5. large industries
6. schools
7. city or county parks

Has your town always been this shape? _____

Make a simple sketch of how you think it looked:

25 years ago:

50 years ago:

100 years ago:

Why do you think this town was started here?

Finding out if you are correct can be fun. Dig into the history books and talk to some of the old-timers in town who probably have some interesting stories to tell about your town's beginning.

Is this the same reason your town exists now?_____
If not, what is the new reason for its existence?

What are some of the advantages and disadvantages to the town's location in relation to its growth. Think about how the town's location would affect it if the population were rapidly increasing, or if the town wanted to make improvements in its facilities and buildings.

Advantages	Disadvantages

Look at the climate summary chart at the end of this section. What is the average winter temperature for your town or the closest town to you?

What is the average summer temperature? When is it the wettest in your town? When is it the driest?

winter_____ wet_____

summer_____ dry_____

What natural features most affect the climate of your town? Think especially about major land features such as mountains, lakes, etc.

Do you think the climate is a major reason for your town existing where it is now? Why?

How does the climate of your town affect your life? For example, do you need air conditioning in the summer? Do you need extra heavy clothes in the winter?

Look at the climate summary chart at the end of this section. What is the average winter temperature for your town or the closest town to you?

What is the average summer temperature? When is it the wettest in your town? When is it the driest?

winter_____ wet_____

summer_____ dry_____

What natural features most affect the climate of your town? Think especially about major land features such as mountains, lakes, etc.

Do you think the climate is a major reason for your town existing where it is now? Why?

How does the climate of your town affect your life? For example, do you need air conditioning in the summer? Do you need extra heavy clothes in the winter?

Land is a basic resource for all living things. How has the land in and around your town (urban and suburban) been used in the past? How is it being used now? How do you think it will be used in the future?

SEQUENCE OF LAND USE IN YOUR TOWN AREA

Land user	Use of the land	Type of settlement	Effects on environment	What residents valued in the environment
Past				
Present				
Future				

Land user	Use of the land	Type of settlement	Effects on environment	What residents valued in the environment
Past				
Present				
Future				

Teacher: The liveability of a town depends entirely upon how its land area is utilized. Land can be used for cars (parking lots, wider streets, freeways); people (malls, parks, housing developments, scenic easements, open spaces); industry; and several other purposes. With our rapidly growing population, making proper land use decisions has become increasingly important and also difficult. Systems of land use planning, such as zoning, are proving to be inadequate in some cases. Evidence of this can be seen in the sprawling human communities which are growing around our nation's cities and towns.

A study of land use, land use decisions, and land use changes in your town is a project your students should undertake. The study can encompass nearly all subjects with the students focusing on the area which most interests them. We have provided some suggestions and questions as a beginning for such a study. However, to make this even more effective the students' field of exploration must be extended.

The most important concept for the students to understand is that human beings make land use decisions and these decisions are subject to error. If this error is to be minimized an informed citizenry is essential.

Referring back to page 20, about how much land in your town is devoted to parks, shopping areas, industrial sites, etc.?

Use	How Much

How would you like to see the land in your town area used in the future?

What agency or office makes the land use decisions in your town?

Referring back to page 20, about how much land in your town is devoted to parks, shopping areas, industrial sites, etc.?

Use	How Much

How would you like to see the land in your town area used in the future?

What agency or office makes the land use decisions in your town?

Does your town have zoning laws?_____ If so, what types of zones are there?

List:

Do different zones have different tax rates?_____
Do these tax rates affect in any way what use is made of the land? How?

Keeping your zoning laws in mind, do you think land use trends could be changed if these laws were modified in some way? Why?

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Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

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How does your town compare with its nearest neighbor? Think about the land use, climate, natural features, size, etc.

The nearest town is: _____

Comparison:

YOUR TOWN AND THE PEOPLE WHO LIVE THERE . . .

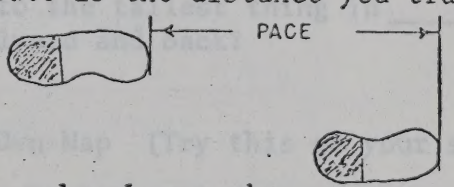
Population is more than just a certain number of residents. It is people, their similarities, and their differences that make population study interesting and meaningful.

When studying the population and its traits, mapping is a useful tool. Before studying your town's population spend some time on learning how to make maps. Knowing how to make and read maps will also be helpful when you are studying man's use of the land.

MAPPING . . . A Useful Study Tool

It is important to know where you are in relation to what is around you at all times. This is one reason people use maps. There are many types of maps for many different purposes. Sometimes it is useful to make your own map for your own purpose.

In order to help you make your own map, you must first determine your pace. Your pace is the distance you travel each time you take a step.



How To Determine Your Pace

1. Mark off 100 feet on level ground.
2. Travel the distance marked off in a normal walk. Do this twice, and count your steps each time.

number of steps taken first time _____

number of steps taken second time _____

TOTAL STEPS TAKEN _____

The total distance walked divided by the total number of steps taken equals your pace:

total distance walked	÷	total number of steps taken	=	your pace

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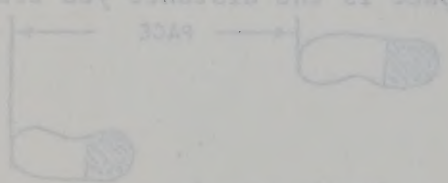

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Using Your Pace

1. When pacing, be sure to walk in a normal easy stride (the same one you used to determine your pace).
2. Count the number of steps it takes to walk the distance you need to know.
3. Multiply the number of steps taken times your pace.

number of steps taken	x	your pace	=	distance traveled

How far is it from:

your classroom to the office and back? _____

your classroom to the gym and back? _____

your classroom to the bus stop and back? _____

your classroom to the tallest thing in your schoolyard and back? _____

Directions For Making Your Own Map (Try this on your schoolyard.)

Materials needed:

2 cardboard cartons, the ends of each having minimum dimensions of 10" x 14"

2 bolts (¼" x 1") with which to fasten the boxes together (or nails)

1 sheet of unlined paper 8½" x 10" minimum

1 wooden 12" ruler

2 tacks or brads, ½" long

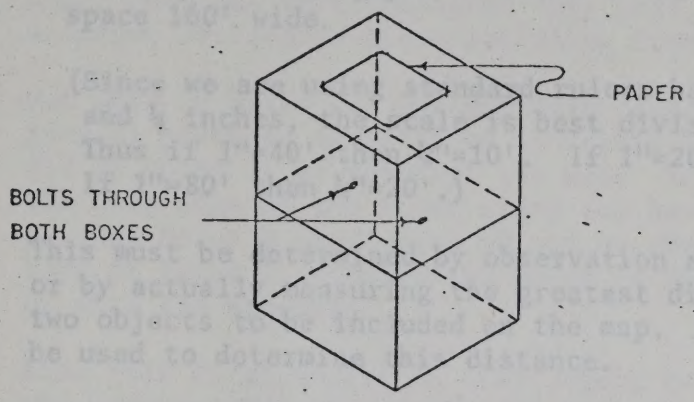
scotch tape or masking tape

pencil

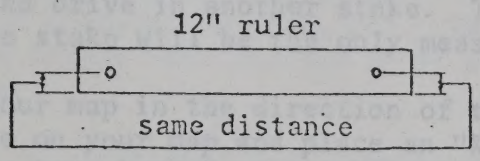
2 stakes, one blueflagged and one redflagged

Method of constructing a plane table

1. Place one box on top of the other on their ends or sides depending upon your height.
2. Using the bolts, fasten both boxes together.



3. Fasten the paper to the end of the box, using the scotch or masking tape.
4. Drive the brads or tacks into the ruler; both tacks must be equidistant from each edge.



These will be used as sighting guides during mapping.

5. The table is now ready.

Mapping With The Plane Table

Organization for mapping

1. Two or more students should work together -- some mapping and the others steadying the equipment.

Method of mapping

1. The size of the area to be mapped determines the scale of the map.

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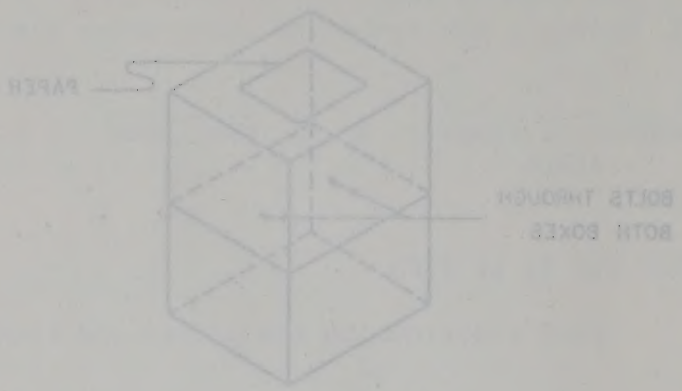

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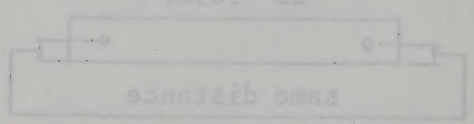

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1. Two or more students should work together -- some mapping and the others steadying the equipment.

Method of mapping

1. The size of the area to be mapped determines the scale of the map.

Given an 8" wide paper a, scale 1"=100' will map a space 800' wide.

Given an 8" wide paper a, scale 1"=40' will map a space 320' wide.

Given an 8" wide paper a, scale 1"=20' will map a space 160' wide.

(Since we are using standard rulers having inches and ¼ inches, the scale is best divisible by 4. Thus if 1"=40' then ¼"=10'. If 1"=20' then ¼"=5'. If 1"=80' then ¼"=20'.)

This must be determined by observation and estimate, or by actually measuring the greatest distance between two objects to be included on the map. Your pace can be used to determine this distance.

Having decided upon a scale, now establish your baseline. Drive in the red flagged stake at the base of the boxes.

Then pace across the longest distance that must be mapped and drive in another stake. The distance between these two stake will be the only measurement needed.

Orient your map in the direction of this line. Draw this line on your map and place an "X" at each point. Label the location of your present point "Point 1". Label the far one "Point 2".

2. Lay the ruler so that one edge is along these points. Moving (turning) your box, line up the tacks or sight along the tacks from your present position to Point 2. This establishes your baseline on the map. The map must continue to be aligned with this baseline during all future mapping.

The theory behind using the plane table is to locate points by intersecting lines. This is the next step you must take.

Given an 8" wide paper a, scale 1"=100' will map a space 800' wide.

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Keeping the base (end) of your ruler on Point 1, rotate the far end until the two tacks line up pointing toward the point to be established, that is, the corner of a building, a tree, porch, telephone pole, etc. Continue this with all things which you wish included on your map. When you have completed this part, you will have a number of labeled lines radiating from Point 1.

Now move to Point 2. The map must remain in the same general postion in relation to Points 1 and 2 as it did at Point 1, so reorient the map. To do this, place the heel edge of the ruler along the baseline and, stand- so that Point 2 is closest to you on the paper, sight back at Point 1, placing the boxes so that the tacks line up with the baseline.

When this is accomplished start again to take sights on the various objects, as you did at Point 1, with the exception that where your line from Point 2 crosses that from Point 1, you can now draw in the object with the knowledge that you have established its location.

This procedure may be carried on indefinitely by setting up a Point 3 beyond Point 2, etc. This could be a prolongation of the baseline 1-2 or it may be in another direction.

When you have finished your mapping set up your scale, a legend, date the map, label the area, and have the crew members sign it.

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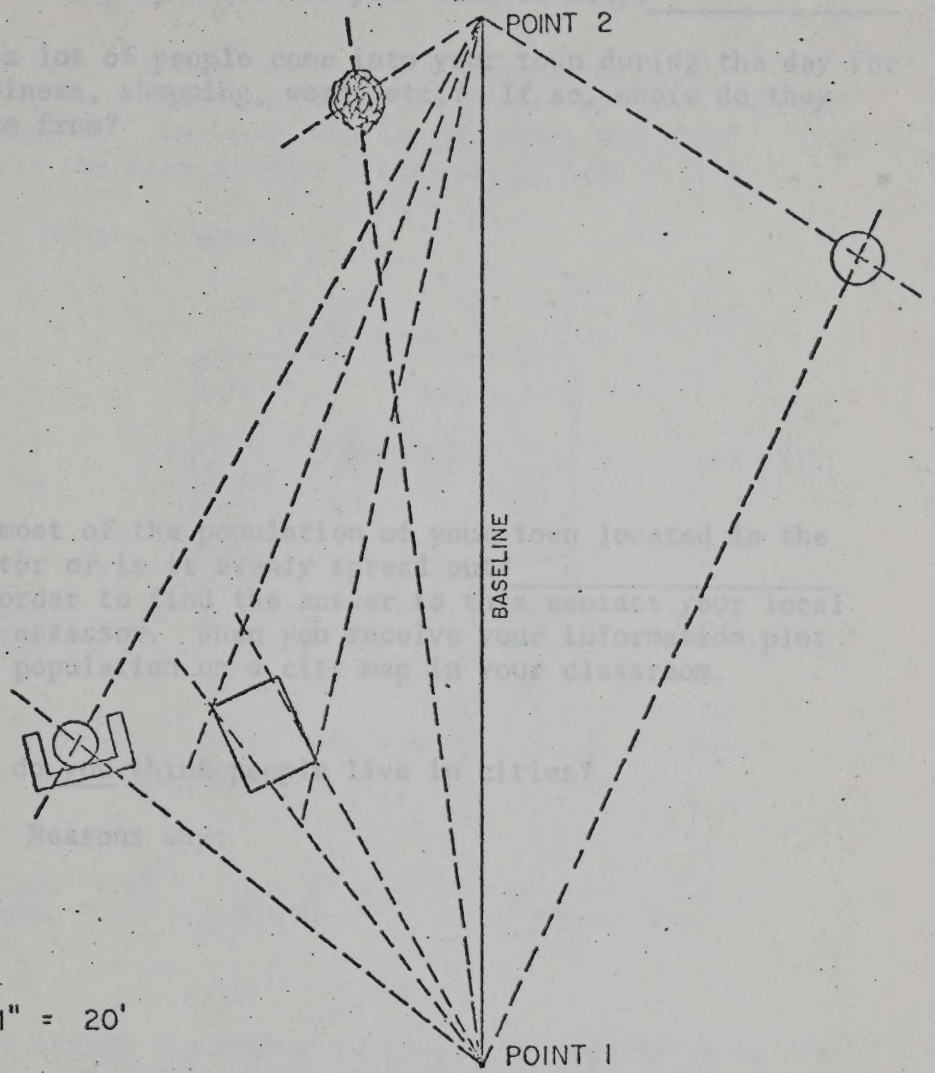
Sample:



SCALE 1" = 20'

CREW: MJ
DH
BT

DATE JUNE 19, 1970
AREA: RANCH HOUSE LAWN

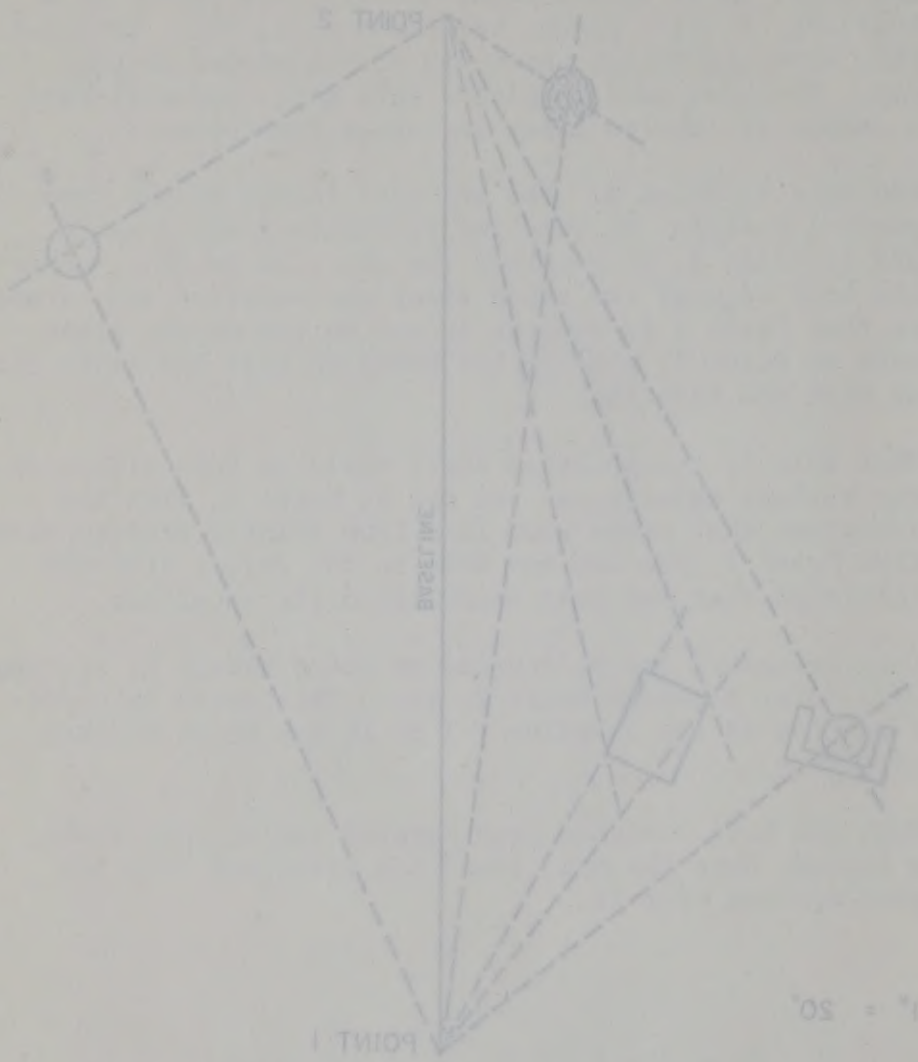
Legend

GATE

HOUSE

APPLE TREE

LIGHTPOLE



People Pressure

How many people live in your town or city?_____

Do a lot of people come into your town during the day for business, shopping, work, etc.? If so, where do they come from?

Is most of the population of your town located in the center or is it evenly spread out?_____
In order to find the answer to this contact your local tax assessor. When you receive your information plot the population on a city map in your classroom.

Why do you think people live in cities?

Reasons why:

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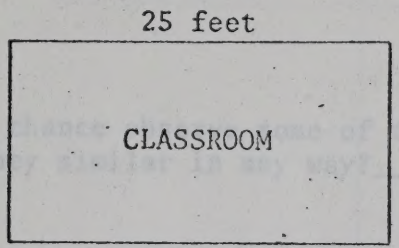
Why do you think people live in cities?

Reasons why:

How large an area does your whole city occupy?_____
See if you can determine this by looking at a map.

How large an area does your classroom occupy?
Using your pace determine the length and width of your classroom. Multiply the length times the width. This gives the area of your classroom in square feet.

Sample Formula:



25	x	20	=	500
length		width		square feet

Your Classroom:

_____	x	_____	=	_____
length		width		square feet

Next divide the number of people in your class by the number of square feet available. This equals the population density of your classroom, or the amount of space available per person.

_____	÷	_____	=	_____
number of people		number of square feet		population density

Knowing the number of people in your town and its approximate size, can you determine its population density?

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See if you can determine this by looking at a map.

How large an area does your classroom occupy?
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Sample formula:

25 feet

CLASSROOM 20 feet

25	x	20	=	500
length		width		square feet

Your Classroom:

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_____	÷	_____	=	_____
number of people		number of square feet		population density

Knowing the number of people in your town and its approximate size, can you determine its population density?

What areas in your city or town are the most crowded? Locate these areas on the map of your city you use in the classroom.

Areas:

If you have a chance observe some of these most crowded areas. Are they similar in any way?_____If so, how?

_____

_____

_____

_____

Express how you feel about these areas using a sketch, a poem, a collage, etc.

Why do people live in crowded areas of their city?

Think about and look into the cost of living in crowded and uncrowded areas. Is there a difference?
As a class you may want to complete the following chart:

	Crowded Area	Uncrowded Area
Average:		
rent		
food cost (per week per family of 4)		
utility cost (per month)		
electricity		
water		
phone		
t.v. cable		
transportation to work		

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Does crowding in the city have anything to do with other problems such as unemployment or racial discrimination? How?

Do some experiments on crowding with your own class. For example, for one day try pursuing your regular class activities in half of the space you normally use.

Is it pleasant to be in a crowd?_____

How do you get along with other students when you're crowded together like this?_____

_____

Using a short story, poem, or sketch describe how it feels to work in a crowded area.

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Using a short story, poem, or sketch describe how it feels to work in a crowded area.

In a park area of your city observe the activities of animals such as birds and squirrels. Notice their behavior in relation to each other's area or territory. What do birds do when other birds approach an area where they are finding food?

What does man do when someone approaches his "territory"?

Thinking back on your study of population and the effects of crowding, how much space do you think an individual human needs to survive? Square feet_____
Did other students in your class come up with the same figure?_____

People require a certain amount of space to survive, and as people approach the limit of available space, their behavior is going to change.

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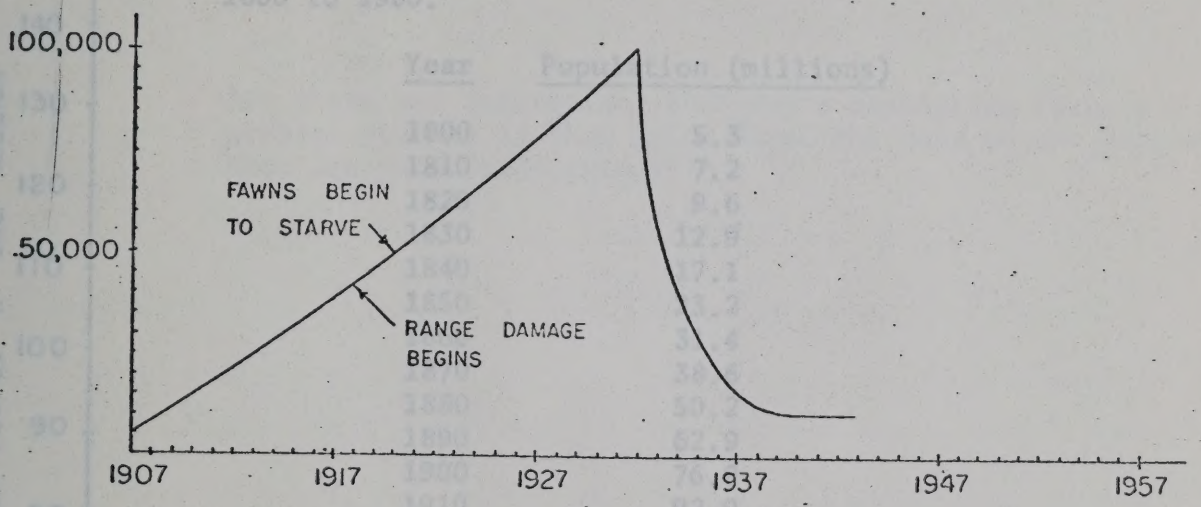
Kaibab Plateau

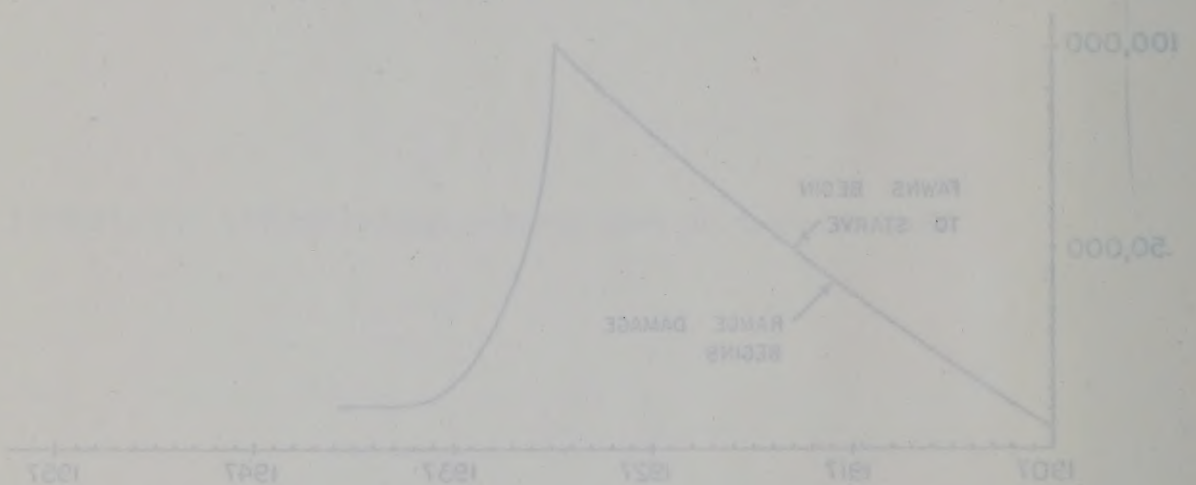
In the early 1900's the deer population of the Kaibab National Forest, Colorado, was 4,000, or one deer for every 175 acres. In 1907 a program to kill the animals which preyed on the deer was begun. This was done so that the deer herd could increase, thus making better hunting for man's recreation. Within 22 years, 716 mountain lions were shot. Within 32 years 11 wolves and more than 7,000 coyotes were killed.

With the natural controls on their population gone, the number of deer present started to climb.



By 1918 there were more than 40,000 deer, or one for every 17.5 acres of land. The food plants on the range began to show signs of damage. By 1920 the fawns were starting to starve. By 1932 the herd had increased to 100,000, or one for every 7 acres of land. This was far above what the land could support. The food plants began to die from over use. During the next two winters about 60,000 deer starved to death. The deer population fell in size every year until by 1939 the herd had dropped to about 10,000 animals all of which were still struggling to survive on a very damaged range. The Kaibab National Forest now could support a population only one-fourth the size that it could in 1918. These remaining animals were still having a very difficult time surviving.

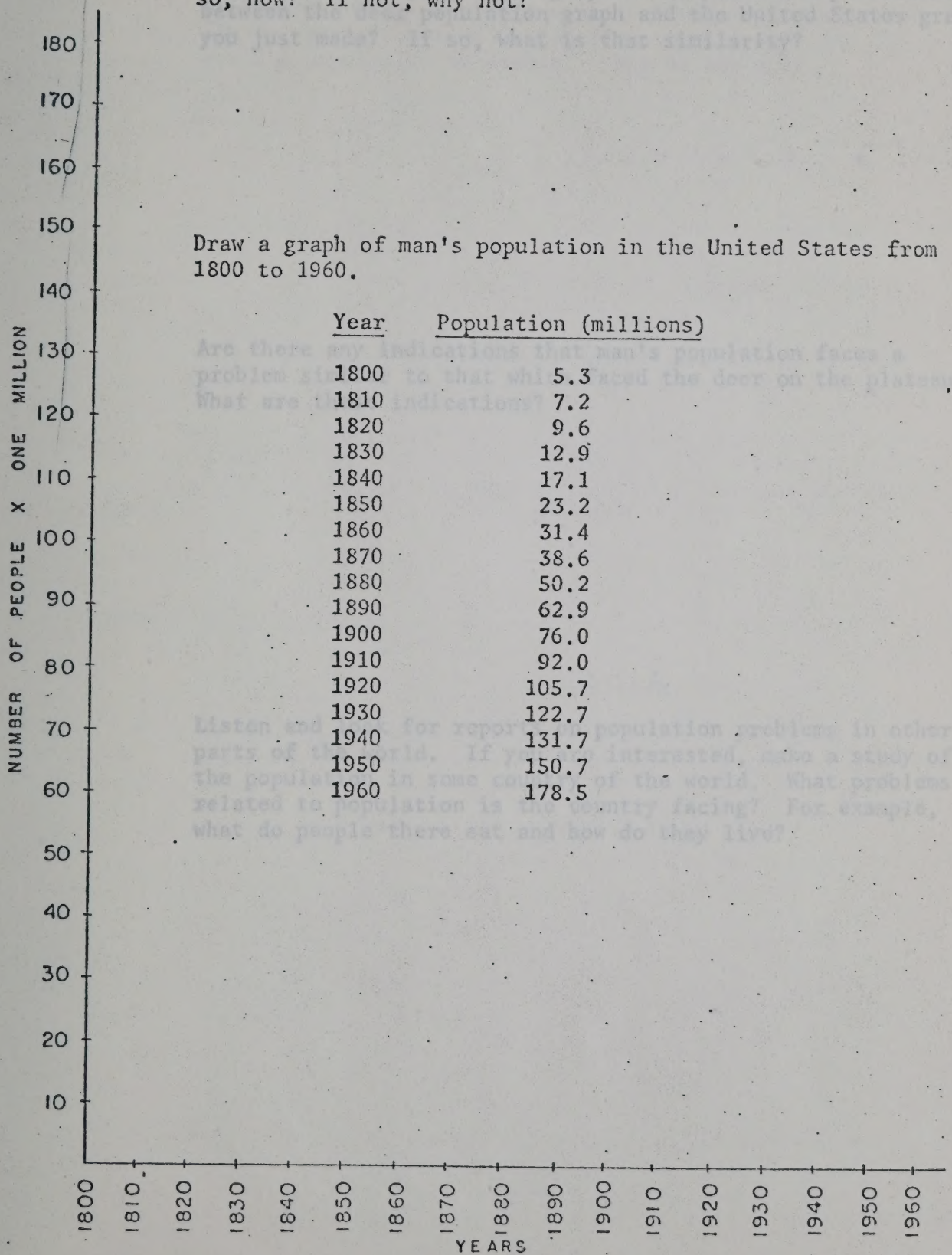
What factors finally limited the deer population on the plateau?


100,000
50,000
RANGE DAMAGE
BEGINS
1907
1947
1957

Is man's population limited by these same factors? If so, how? If not, why not?

Draw a graph of man's population in the United States from 1800 to 1960.

Year	Population (millions)
1800	5.3
1810	7.2
1820	9.6
1830	12.9
1840	17.1
1850	23.2
1860	31.4
1870	38.6
1880	50.2
1890	62.9
1900	76.0
1910	92.0
1920	105.7
1930	122.7
1940	131.7
1950	150.7
1960	178.5



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1900	76.0
1910	92.0
1920	105.7
1930	122.7
1940	131.7
1950	150.7
1960	179.5

Compare the two population graphs. Do you see any similarity between the deer population graph and the United States graph you just made? If so, what is that similarity?

Are there any indications that man's population faces a problem similar to that which faced the deer on the plateau? What are these indications?

Listen and look for reports on population problems in other parts of the world. If you are interested, make a study of the population in some country of the world. What problems related to population is the country facing? For example, what do people there eat and how do they live?

In your opinion, can the world feed, clothe, and house twice the number of people we have today in forty years? (Forty years is the estimated time it will take for the world's population to double.) Why or why not?

In your opinion, can the world feed, clothe, and house twice the number of people we have today in forty years? (Forty years is the estimated time it will take for the world's population to double.) Why or why not?

YOUR TOWN . . . HOW IT WORKS AND SURVIVES

"Modern man seems to believe he can get everything he needs from the corner drug store. He doesn't understand that everything has a source in the land or sea, and that he must respect these sources."

Thor Heyerdahl

Where does everything in your town come from? Certainly not from the corner drug store or the super-market or the department store; where then? Your town is composed of much more than people, businesses, and houses. It functions as a complex net of interacting systems. Systems which when they function properly keep you informed, housed, clothed, and well fed.

The city is very much like your body. If it is not treated properly it will not function as it should. In this section we'll explore further the life support systems of a city and the people in it.

Essential Commodities

Using the chart on the following page, keep a week's record of all of the foods you eat. Compare your diet to that of the people in the country you previously studied. What are some of the reasons for the differences?

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Using the chart on the following page, keep a week's record of all of the foods you eat. Compare your diet to that of the people in the country you previously studied. What are some of the reasons for the differences?

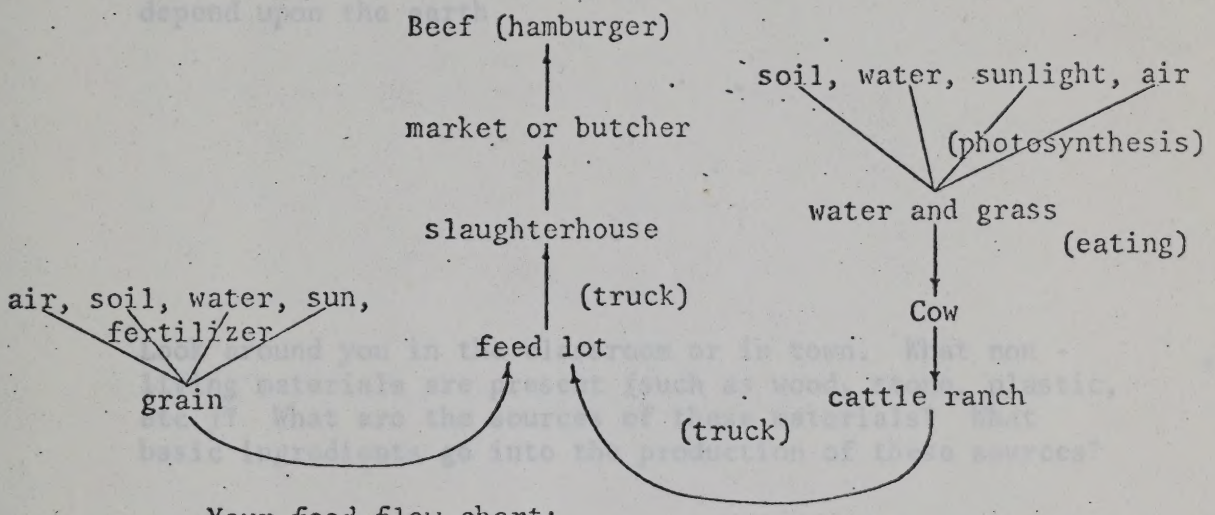
TYPES OF FOODS YOU EAT

	Meat and Fish	Dairy Products	Breads and Cereals	Fruits and Vegetables	Candy, Pop, etc.
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

	Meat and Fish	Dairy Products	Breads and Cereals	Fruits and Vegetables	Candy, Pop, etc.
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

Pick one of your favorite foods and trace back through all the steps it takes for that food product to get from the land to you. Find out exactly where the food product comes from. Does it come from far away? If so, how did it get to your town?

Sample of a food flow chart:



Your food flow chart:

Beef (hamburger)
market or butcher
slaughterhouse
(truck)
feed lot
air, soil, water, sun,
fertilizer
grain
(truck)
cattle ranch
cow
water and grass
(eating)
soil, water, sunlight, air
(photosynthesis)

How many steps has your food product gone through?_____

Do any of your foods actually originate from within the city?_____

_____

What land resources are necessary to provide the transportation means for your food products? This gets fairly involved but it is interesting to discover how much you depend upon the earth.

Look around you in the classroom or in town. What non-living materials are present (such as wood, stone, plastic, etc.)? What are the sources of these materials? What basic ingredients go into the production of these sources?

Materials	Sources	Basic Ingredients
1. wood desk	trees	water, sun, air, soil
2. book		
3.		
4.		
5.		
6.		
7.		
8.		

Materials	Sources	Basic Ingredients
1. wood desk	trees	water, sun, air, soil
2. book		
3.		
4.		
5.		
6.		
7.		
8.		

Pick an object which is made out of one of these materials, such as a desk top or clothing, and trace all the steps it took to get the finished product to you from the original raw materials. Be sure to include the transportation and manufacturing steps that are involved.

Roughly speaking, how many people depend on the production and transportation of this product for their jobs and income? (A lot? A few?)

Water - Its Supply And Use

Water is a resource none of us can live without. It has endless uses and yet today we seem to be taking its availability for granted. As demands for water increase, we must utilize our water resources carefully since there is only so much available at any given time.

From where does your town get its water? Find out from your city government about how much water your town uses on an average day in the summer; in the winter.

Town's water source(s)_____

Average daily use (summer)_____

Average daily use (winter)_____

Is your town's water rationed in any way? For example, is the amount you use measured with a meter? If so, how does this prevent water from being wasted?

Is your town's water treated in any way?_____
How is this done and what chemicals are used? Why?

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Is your town's water treated in any way?_____
How is this done and what chemicals are used? Why?

What are the major uses of water in your town? Think not only about how families use the water but also about the industrial uses, etc.

Find out how much water your household uses in a day or month. You can figure out what the major uses of water are in your household by taking a few simple measurements. For example, a toilet uses about 7 gallons of water every time you flush it. Can you figure out how much water is used in:

1. the bath or shower_____

2. the clothes washer_____

3. watering the garden_____

4. personal consumption_____
(drinking & cooking)

Does the water leave your household in the same condition as it came?_____

How has it changed?

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(drinking & cooking)

Does the water leave your household in the same condition as it came?_____

How has it changed?

What happens to the waste water after it leaves your house?

Is there a sewage treatment plant in your town? If not, why not?

If the sewage is treated, what kind of treatment does it receive and where does it go after treatment? Locate this place on a map of your town.

What happens to the waste water after it leaves your house?

Is there a sewage treatment plant in your town? If not, why not?

If the sewage is treated, what kind of treatment does it receive and where does it go after treatment? Locate this place on a map of your town.

The Disposable Environment?

A major problem today is the disposal of solid wastes. Not only do we have to worry about where to put our discarded cars and our aluminum, plastic, and glass containers; we must also concern ourselves with the depletion of resources that go into making these products.

How and where does your town dispose of its garbage? Is this posing any problem to your town? What?

An interesting project is to figure out how much solid waste your household is producing per day. Using a bathroom scales, determine how many pounds of various types of solid wastes your household produces each day for a week.

Day	Cans and Metal (lbs.)	Paper (lbs.)	Plastic Products (lbs.)	Food Refuse (lbs.)	Glass (lbs
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					
	total	total	total	total	total

Add the weekly totals of each type to discover the amount of garbage your household produces in a week.

amount per week	x	52	=	amount used per year

Do you think any of these "waste" materials could be reused? If so, which ones?

Materials which can be reused:

Of the materials being thrown away, which ones originate from resources which cannot be restored by man? Refer back to the table you made of materials, sources, and basic ingredients.

Resources which can be restored by man:

1.

2.

3.

4.

5.

How are these sources renewed? To find out contact agencies which deal with the land and its resources.

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Resources which cannot be restored by man:

1.

2.

3.

4.

5.

As we slowly use up these resources which cannot be restored by man, what do you suppose is going to happen? Use any media you wish in order to communicate what you think will happen. Try a poem, a short story, or a sketch.

Teacher: The cry of power shortages has been heard in all portions of the United States. However, the building of more dams means submerging vast amounts of land and destroying our wild rivers; using radioactive fuels creates non-disposable radioactive wastes and may result in thermal pollution of our waters; and utilizing fossil fuels contributes to air pollution and increases the chance of disaster during the extraction process. Keeping these consequences in mind, we should carefully consider the current demand for more power production facilities.

Perhaps the problem is not a power shortage, but rather a frivolous use of our present power supply.

Energy - Critical Needs Or Excessive Wants?

In the "all electric world" we live in today the source of the energy needed for light, heat, and power is often forgotten. Most electrical power is generated by the combustion of stored fossil fuels, the controlled reaction of radioactive materials, and utilization of potential energy present in falling water.

When studying the question of power needs versus wants, you should keep in mind the environmental consequences of providing more power production facilities.

What is your town's source of electrical energy?_____
How is it produced?

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When studying the question of power needs versus wants, you should keep in mind the environmental consequences of providing more power production facilities.

What is your town's source of electrical energy?_____
How is it produced?

How is your home heated?

What is the original source of this energy?

How do you use electrical energy in your day to day life? For one day, keep track of your uses of electricity. Also list the purpose for which you put this electricity to use.

My daily uses of electricity:

	Use	Purpose
example:	1. electrical can opener	1. open dog food can

How many of these uses could you do without and still lead a comfortable life?

There is currently a great concern in our country over power shortages. Can you think of any way to eliminate this shortage without producing more electricity and building more power dams? How?

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Industrial Effects On Your Town

One of the main reasons for people moving to the cities in this century has been the location of jobs. People in the city depend upon their job for an income which will buy food produced in the rural area as well as other goods and services. Both good and bad effects result from an industry locating in a town. Jobs are created and income flows into the town, but negative effects can also occur.

What is the main industry (or industries) in your town?

About how many people in town depend on this industry for their living?

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What is the main industry (or industries) in your town?

About how many people in town depend on this industry for their living?

How might the climate affect the types of industries located in your town and their operation?

Think of the effects (both good and bad) that this industry has on: land, air, animals, water, the town, people, you

Give some examples:

	Good	Bad
land		
air		
animals		
town		
people		
you		

PROBLEMS IN YOUR TOWN . . . AIR, NOISE, WATER

Pollution - Where does it come from and why does it occur? You can answer these questions for yourself by looking at the processes various materials go through to become finished products. The production of goods and services for people usually has both good and bad effects. Bad effects occur in the form of pollution and good effects in the form of desirable products. In an earlier part of this guide you traced the steps it takes for various materials to reach you as finished products. Now you can take a closer look at this process.

Think of a product that you use often and trace in some detail the steps it takes from: raw material → production → finished product → use → disposal. For each step decide what the good and bad effects are. Be sure to look at the processes involved in each step of production and also what happens to the product after it is used. This may take some research.

The product is_____

Raw Materials:

List:

What happens to the raw materials before they go through the production process?

_____

_____

_____

_____

_____

good effects: _____

_____

_____

_____

bad effects: _____

_____

_____

_____

Steps in Production:

List:

What effect does each of these steps have?

good effects: _

_____

_____

_____

bad effects: _____

_____

_____

_____

Finished Product:

What do you do with the product after you get it?

_____

_____

_____

_____

Steps in Use:

List;

What effect does each of these steps have?

good effects: _____

_____

_____

_____

bad effects: _____

_____

_____

_____

Disposal:

How is the waste from this product disposed of?

_____

_____

_____

_____

_____

_____

Steps in Disposing of Waste from Product or Worn Out Product:

List:

What effects does disposing of this product or its wastes have?

good effects: _____

_____

_____

_____

bad effects: _____

_____

_____

_____

Observe your city from a hill or tall building.
What are the sources of the pollution you can see, hear, or smell?

	Sources	Type of Pollution
example:	lumber mill - from burning of waste materials	smoke in air

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Source	Type of Pollution
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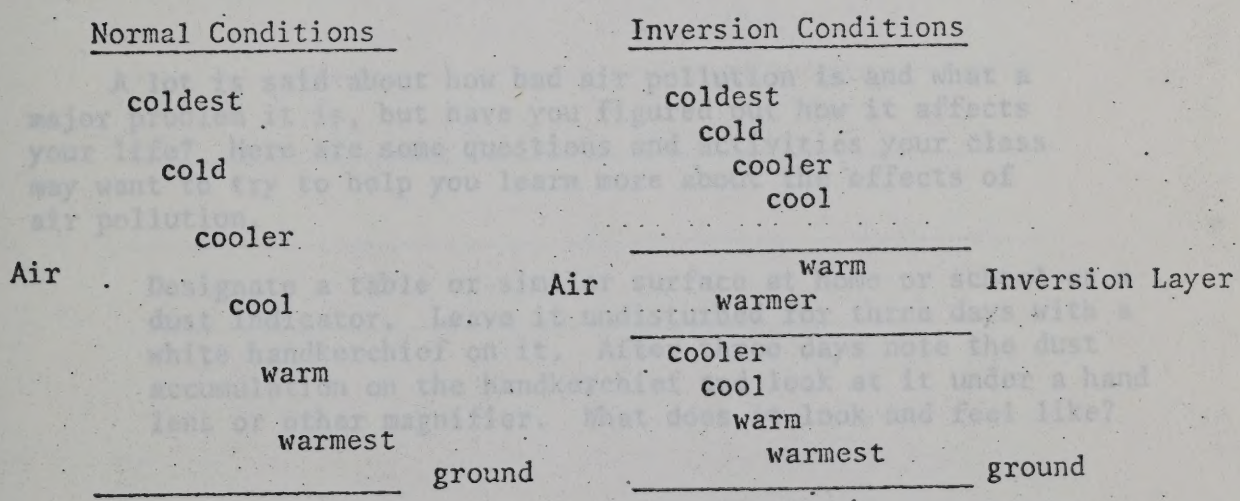
Locate and describe the source and type of pollution on a map of your city. Does this pollution occur near any residential areas?_____ If so, how might it affect the people who live there?

Notice the days when your city's air is dirtiest; find out what the weather pattern is on these days (high or low pressure, velocity, wind). Find out from the weather bureau in your area if inversion conditions ever exist. Inversion conditions occur when a warm layer of air is trapped between two cooler layers of air. This prevents the atmosphere from mixing and air pollution could be more serious on days like this. See the diagram below.



From your exploration of the weather do you see any relation between days of bad air pollution and the weather patterns over your town?_____
If so, what is this relationship?

Do you think smoke can be emitted in large quantities on any day without causing an air pollution problem or should the daily weather patterns be considered before allowing smoke emissions? Why or why not?

A lot is said about how bad air pollution is and what a major problem it is, but have you figured out how it affects your life? Here are some questions and activities your class may want to try to help you learn more about the effects of air pollution.

Designate a table or similar surface at home or school as a dust indicator. Leave it undisturbed for three days with a white handkerchief on it. After three days note the dust accumulation on the handkerchief and look at it under a hand lens or other magnifier. What does it look and feel like?

_____

_____

_____

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Do you have any idea where some of the particles came from?

Notice what accumulates on a clean car after it is left out overnight. Keeping this in mind, how do you think dirty air affects your life, or does it?

What would this air do to your clean clothes if they were hung outside to dry?

What might this air do to your lungs?_____

_____

_____

_____

_____

Using a poem, cinquain, sketch, story, or any other form of communication, express how you feel about the air in your town.

What might this air do to your lungs?_____

_____

_____

_____

_____

Using a poem, cinquain, sketch, story, or any other form of communication, express how you feel about the air in your town.

If there is an air pollution problem in your town set up a class project designed to help solve this problem. The use of games with students playing the role of various community groups is an exciting way to learn more about how to solve any community problem.

Here is an example of a simulation game which your class might want to try:

The Problem

An industry in town is putting out great quantities of black smoke as a result of the burning of its waste products. The town is located in a valley which means the smoke is not blown away easily. A group in town has formed to stop the pollution of the air. This group is complaining to the town council about the smoke problem. The industry says it cannot afford to change its method of waste disposal. Other people in town oppose the control of the smoke because they feel it will discourage industry from moving to their town. They say this would prevent economic development.

The Players

1. Town Council -- This is the town's governing body which will decide whether or not the smoke pollution will be stopped. The purpose of the other groups is to persuade this council through their representatives that their position is correct.

2. Industry Representatives -- This group represents the industry which is causing the smoke pollution. They are naturally concerned with their interests and want to keep their profits at a maximum. However, they are interested in public opinion and may respond to public pressure. The group claims that their economic development will be harmed if strong controls on smoke emissions become law.

3. Citizens For Clean Air -- This group is determined to solve the smoke pollution problem as soon as possible. Its members believe that a clean environment is more important than a profitable industry in town. The group also believes that the waste product being burned could be put to a valuable use. Most people in this group do not depend on the industry for their jobs.

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4. Citizens For Economic Development -- This group is composed of businessmen and also people who work for the industry causing the smoke pollution. They are siding with the industrial group since they are concerned with the town's economy. However, this group realizes that environmental quality is important and might seek a slow, gradual solution to the problem so that the industry is not hurt.

Procedure

Divide the class into the various groups. Each group should meet and discuss what they want the town council to do about the problem, and what they think is needed to make this a better place to live. Their ideas should be based upon some research into the problem, not just personal opinion. Elect a spokesman for each group to present its "case" to the town council when the class meets as a whole again. The town council should elect one of its members to be in charge of the meeting. After listening to the representatives from the different organizations the town council should come up with a list of priorities -- a list of what they are going to act upon first, second, etc. The class may wish to invite a member of the real town council to meet with them and discuss their ideas.

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Recall what sounds were heard in the first part of the guide. When and where were the sounds the loudest and the most common? _____

_____

_____

_____

Using the map your class made on population density how does the location of loud sounds compare to the parts of your town which are most crowded?

How do these locations compare with those from which the air and water pollution in your community are coming?

Is there any relationship between water and air pollution and noise pollution?

Could noise pollution have a bad effect on people, too? How?

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As a class choose one object with an annoying noise and try to quiet it.

Object: _____

Method used to quiet noise: _____

_____

_____

Was it successful? Why or why not? _____

_____

_____

What object would you like to quiet the most now?

_____

How would you go about doing this? _____

_____

_____

Describe by either a sketch or a poem why you find this noise annoying.

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_____

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_____

How would you go about doing this? _____

_____

_____

Describe by either a sketch or a poem why you find this noise annoying.

What river runs through or near your town?_____.

Where does it start? If you do not know look at a state map or a map of the United States. _____

_____

What happens to this river as it flows toward the sea?

_____

_____

Where are most of the towns located on the river, near the beginning or where it runs into the sea?_____

What do you think will happen to the river as it runs through the town? What materials will probably be added to it?

_____

_____

_____ What materials will probably be taken away? _____

_____

_____

With your class, travel to a place along the river upstream from your town.

With one word describe how the river smells_____

With two words describe how it looks_____

With three words describe how it feels_____

With two words describe how it tastes (if safe)_____

With one word describe how it sounds_____

What river runs through or near your town? _____

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With two words describe how it looks _____

With three words describe how it feels _____

With two words describe how it tastes (if safe) _____

With one word describe how it sounds _____

What materials do you see in and along the water which don't really belong there? For example, are there any old tires or tin cans?

List of materials found:

What can you do to help correct this problem?

What plants and animals do you find living in the water?

Plants: name or describe	location (edge, middle, etc.)

Animals: name or describe	location (edge, middle, etc.)

Plants: name or describe	location (edge, middle, etc.)

Animals: name or describe	location (edge, middle, etc.)

Animals that live in the water cannot stand too much acid or alkali in the water. Using a pH kit test the water to determine how acid or alkali it is. Follow the directions found in the kit.

What is the pH of the water tested?_____

Looking at the chart below, what animals would most likely be found here?_____

_____

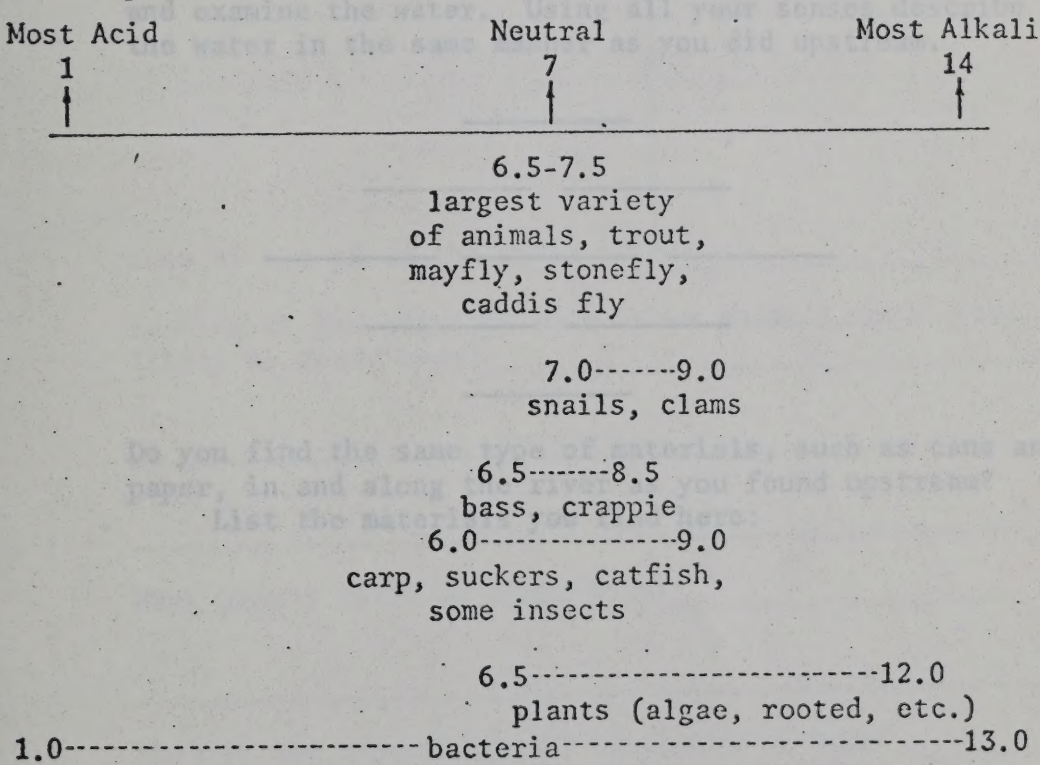
_____

What plants would be found here?_____

_____

_____

pH RANGES THAT SUPPORT AQUATIC ANIMAL AND PLANT LIFE



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_____

_____

What plants would be found here?_____

_____

_____

pH RANGES THAT SUPPORT AQUATIC ANIMAL AND PLANT LIFE

All life needs oxygen in order to live. Pollution reduces the amount of oxygen in the water. So do water plants. Using the pH kit test for the amount of useable oxygen present in the water. Follow the directions given in the kit.

What is the water's oxygen content?_____

Looking at the chart below, how much life can this amount of oxygen support?_____

Useable oxygen in ppm reading	Variety of life
below 5	very little life can survive
above 5	large variety of life

Now travel to a place on the river just below the town and examine the water. Using all your senses describe the water in the same manner as you did upstream.

_____

_____ _____

_____ _____ _____

_____ _____

_____

Do you find the same type of materials, such as cans and paper, in and along the river as you found upstream?

List the materials you find here:

What plants and animals do you find living in this part of the river?

Plants: name or describe	location (edge, middle, etc.)

Animals: name or describe	location (edge, middle, etc.)

What is the pH of the water here?_____

Looking at the previous page, what animals would most likely be found here?_____

_____

_____

What plants would be found here?_____

_____

What is the oxygen content of the water here?_____

Looking at the previous page, how much life can this amount of oxygen support?_____

Is there any difference between the water above and below your town?_____ If so, what and why?___

_____

_____

_____

Where did you like the river the best?_____
Why?

Make a drawing of what the river would look like if it ran through a hundred towns just like yours. Would you like to live along it?

Is there any difference between the water above and below your town?_____ If so, what and why?___

_____

_____

_____

Where did you like the river the best?_____
Why?

Make a drawing of what the river would look like if it ran through a hundred towns just like yours. Would you like to live along it?

After finding out about your town, its life support systems, and its problems, describe how you would most like your town to change and why. Use any form of communication you wish.

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REFERENCES

OREGON CLIMATOLOGICAL DATA (from 1969 summary)

U.S. Department of Commerce - Environmental Sciences Services Administration

Region	Total Precipitation													Average Tempe	
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual	Winter (Jan)	Summer (July)
Coastal															
Astoria	12.02	5.67	3.16	3.84	3.92	3.63	.56	.62	6.55	5.28	5.77	11.69	62.71	34.3	58.6
Cape Blanco	16.33	11.30	3.52	7.02	2.31	2.74	.14	.03	3.95	6.79	6.38	19.68	80.19	42.1	53.2
Newport	14.66	7.15	4.09	5.91	3.96	5.68	.56	.36	4.45	5.65	5.24	15.34	73.05	38.8	56.9
Reedsport	18.11	7.57	4.07	4.41	2.42	4.07	.15	.08	4.95	6.33	5.02	15.46	72.64	39.7	59.9
Tillamook	14.26	6.78	4.55	5.69	4.77	6.08	.64	.61	5.44	7.80	7.80	16.19	80.61	37.1	57.1
Willamette Valley															
Albany	8.92	3.68	1.94	2.20	1.52	2.43	.00	T	3.01	3.98	3.22	9.42	40.32	35.4	64.6
Corvallis	10.03	4.27	1.87	2.21	1.14	1.73	.05	.01	3.15	3.57	2.63	9.22	39.88	34.4	64.3
Dallas	11.93	5.61	1.61	2.61	1.06	1.78	T	T	3.28	4.57	3.50	11.83	47.77	34.6	64.0
Eugene	12.67	3.21	2.74	2.92	2.38	3.13	T	T	2.05	4.22	2.74	11.68	47.74	36.9	66.5
Portland	7.60	3.14	1.13	2.28	1.61	2.99	.14	.04	3.86	3.02	3.18	8.12	37.11	34.1	67.6
Southwestern Valleys															
Grants Pass	9.69	2.24	.62	.94	1.89	.67	.08	.00	1.19	3.82	1.31	9.56	32.81	38.0	70.4
Ashland	5.54	2.24	.36	1.51	1.90	3.68	.05	.00	.45	2.36	.65	5.60	24.34	34.5	69.1
Riddle	9.21	1.96	.92	1.26	1.88	1.20	T	.00	.89	3.00	1.23	9.85	31.40	39.1	66.1
Winchester	8.49	2.94	1.10	2.04	1.62	1.91	.00	T	1.32	3.48	1.32	9.94	34.16	----	----
Toketee Falls	9.72	3.18	2.84	3.77	1.93	2.72	.22	.00	1.75	5.03	2.28	9.90	43.34	33.3	66.9
Northern Cascades															
Detroit	18.20	5.07	5.50	4.28	3.58	5.99	.08	.05	3.69	6.67	4.55	14.04	71.70	30.1	----
McKenzie Bridge	14.56	5.06	5.66	5.07	3.40	5.85	.08	T	2.88	6.11	3.86	14.31	66.84	32.3	65.5
Santiam Pass	20.22	5.05	5.24	4.00	3.70	8.00	.88	T	3.70	7.79	4.62	14.19	77.39	22.5	57.4
Government Camp	20.01	5.18	6.49	4.81	4.53	5.57	.78	.38	2.56	6.87	4.48	11.92	73.58	22.9	55.7

igh Plateau															
hemult	5.03	2.10	.81	.56	.88	1.16	.59	.00	.19	1.38	.45	6.82	20.49	23.6	56.2
rater Lake NP HQ	12.88	6.55	4.24	4.45	1.67	4.70	.01	.00	.99	5.75	2.46	14.05	57.75	21.0	47.7
remont	2.55	.19	.32	.29	.73	3.03	.06	.00	.36	.88	.67	2.08	11.16	24.9	55.4
ound Grove	6.09	.82	1.03	1.37	.97	3.22	.00	.00	1.36	2.30	1.02	5.27	23.45	26.5	56.2
orth Central															
ntelope	2.79	.55	.85	.84	1.17	3.45	.10	.00	.82	1.18	.58	1.84	14.26	24.7	64.4
ood River	7.95	2.45	1.47	1.07	1.05	.92	.03	.07	.86	2.19	1.26	7.13	26.45	25.5	66.1
lton Freewater	3.86	1.20	.76	2.01	.98	1.69	.01	.00	.56	1.10	.30	2.27	14.74	23.9	71.0
ndleton	2.86	.79	.43	2.31	1.26	.75	.06	.00	.60	1.46	.44	2.38	13.34	22.0	69.8
ne Dalles	3.23	.75	.83	.46	.69	.31	.04	.00	.40	.78	.32	3.01	10.82	24.2	69.9
outh Central															
nd	2.62	.71	.68	.21	1.14	3.20	.23	.00	.49	.88	.35	2.50	13.01	25.0	59.1
rns	3.17	1.47	.31	.45	.30	1.33	T	T	.22	1.03	.46	3.10	11.84	25.9	61.0
amath Falls	4.12	1.08	.32	.45	.85	1.46	.09	.00	.41	2.06	.40	4.69	15.93	27.0	61.0
ineville	1.10	.48	.39	.52	.98	2.93	.17	.00	.58	1.13	.31	1.64	10.23	25.4	61.2
dmond	.74	.41	.40	.14	.86	3.66	.06	.00	.09	.77	.17	1.19	8.49	26.4	62.0
rt Mountain Refuge	2.79	.78	1.34	1.03	.73	4.03	.04	T	.93	1.66	.52	1.61	15.46	26.8	54.6
keview	5.61	1.33	.72	.89	.34	3.31	.01	.00	.09	2.31	.99	3.86	19.66	27.3	59.7
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terprise	1.18	.30	.17	1.11	1.39	2.99	.26	.00	1.54	.95	.08	1.27	11.24	24.4	58.2
hn Day	1.11	.79	.59	1.91	1.68	3.45	.23	.00	.49	1.70	.57	1.58	14.10	30.1	62.4
Grande	2.18	1.00	.82	2.83	1.42	2.49	.34	.00	.92	1.40	.87	1.81	16.08	27.7	64.0
chland	1.18	1.01	.26	1.13	1.27	2.40	.00	.00	.40	.41	.39	1.92	10.37	32.1	66.0
out Springs	12.04	3.89	4.79	4.93	2.51	3.85	.29	.00	1.47	4.14	2.14	8.42	48.47	19.3	54.2
utheast															
ulah	2.50	1.08	.22	.31	.70	1.22	.00	.00	.22	1.23	.18	2.85	10.51	27.9	64.2
onside	2.43	1.46	.48	.40	.50	2.25	.03	.00	.55	.53	.08	3.33	12.04	----	60.2
Dermitt	2.37	.67	.33	.81	.46	1.83	.63	.00	.05	.85	T	.43	8.43	32.5	61.6
ckville	3.01	.32	.10	1.58	.73	2.60	.00	.00	.10	1.66	.22	1.77	12.09	30.2	60.9
me	1.71	.27	.05	.67	.53	1.15	T	.00	.08	.54	.24	.99	6.23	32.3	62.7

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Index to State of Oregon Map

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3. Newport
4. Reedsport
5. Tillamook

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7. Corvallis
8. Dallas
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12. Ashland
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14. Winchester
15. Toketee Falls

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17. McKenzie Bridge
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19. Government Camp

High Plateau
20. Chemult
21. Crater Lake NP HQ
22. Fremont
23. Round Grove

North Central
24. Antelope
25. Hood River
26. Milton Freewater
27. Pendleton
28. The Dalles

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29. Bend
30. Burns
31. Klamath Falls
32. Prineville
33. Redmond
34. Hart Mountain Refuge
35. Lakeview

Northeast
36. Enterprise
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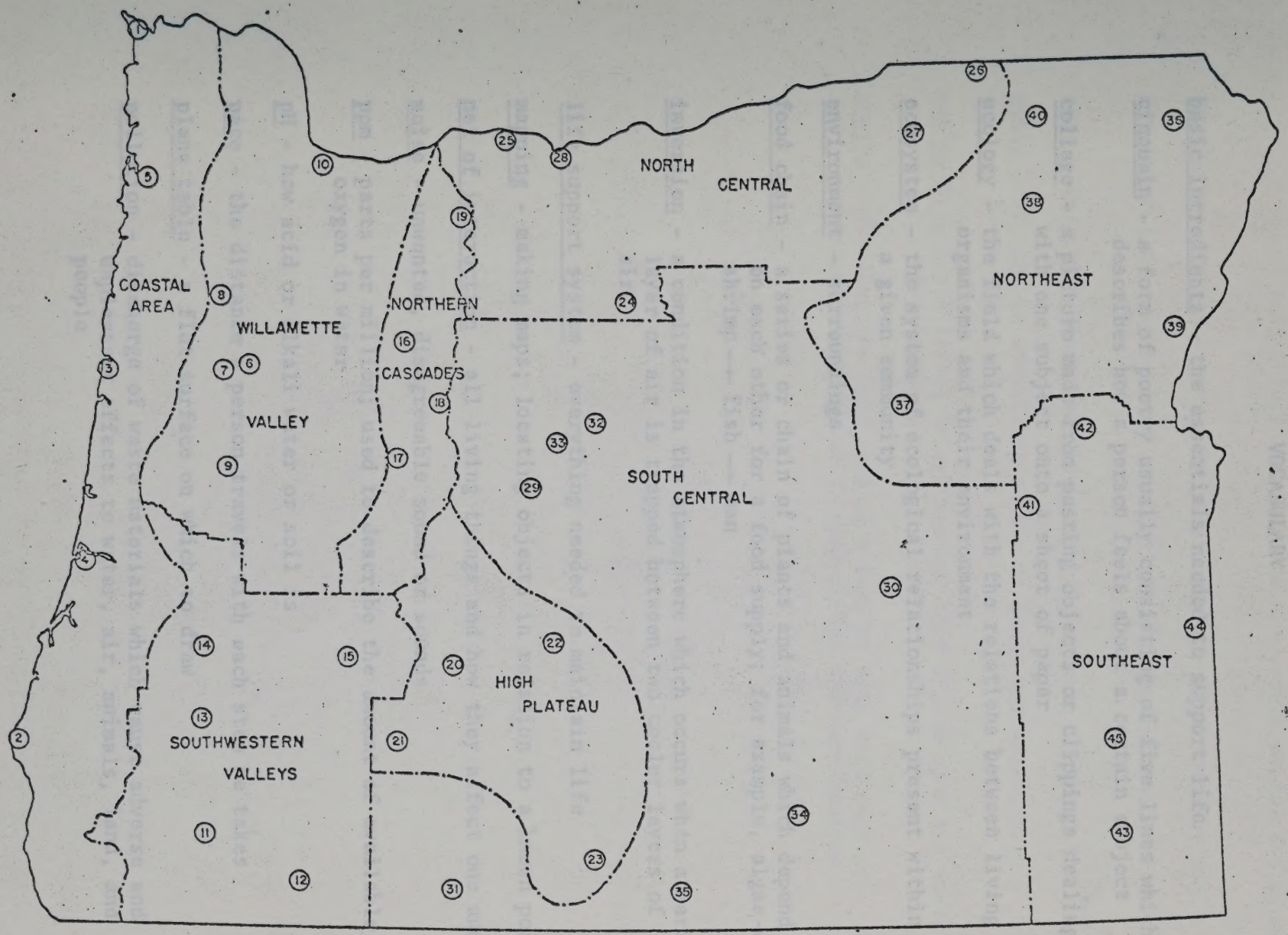
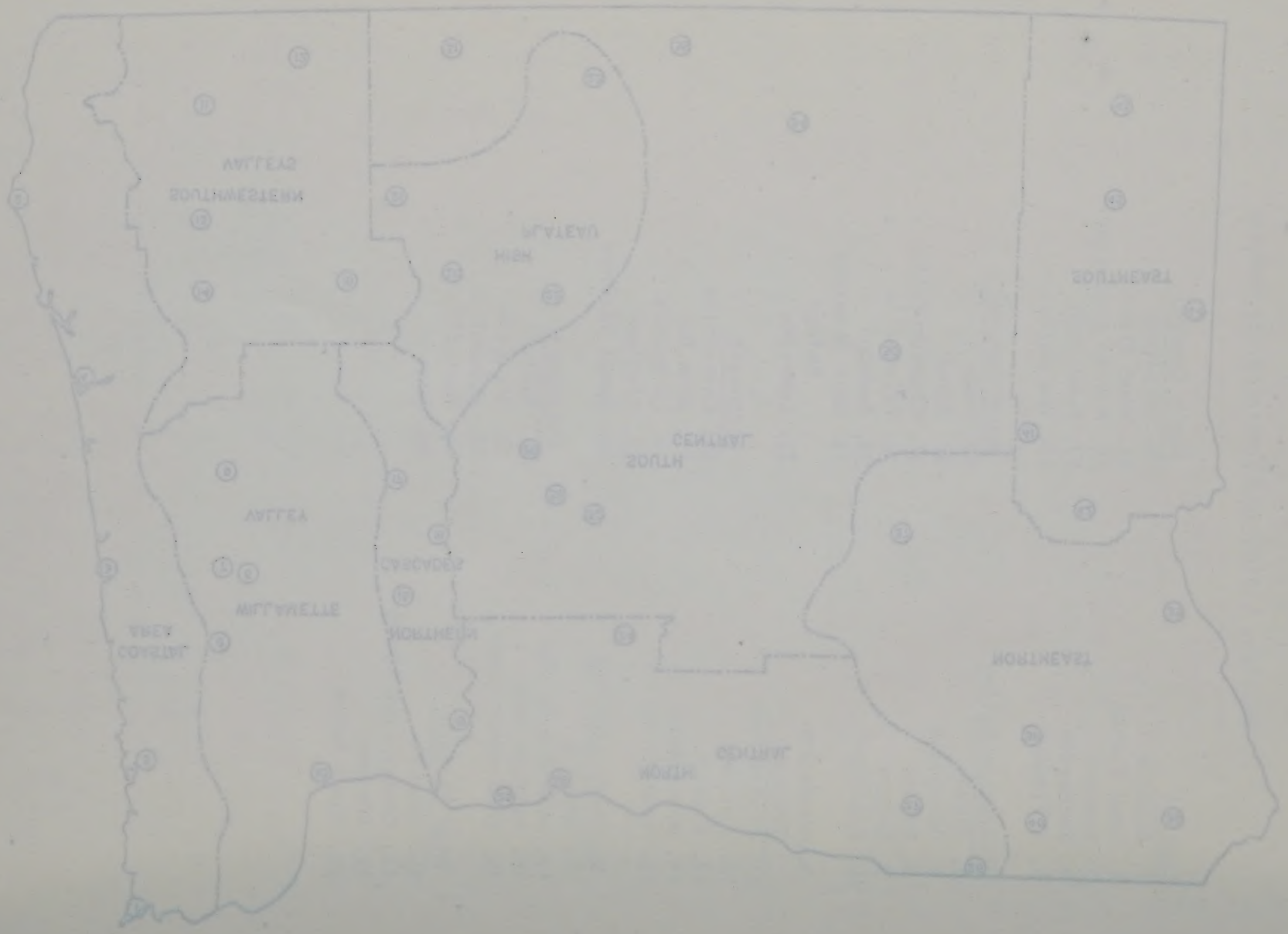

NORTH CENTRAL
NORTHEAST
COASTAL AREA
WILLAMETTE VALLEY
NORTHERN CASCADES
SOUTH CENTRAL
HIGH PLATEAU
SOUTHWESTERN VALLEYS
SOUTHEAST



VOCABULARY

basic ingredients - the essentials needed to support life

cinquain - a form of poetry usually consisting of five lines which describes how a person feels about a certain subject

collage - a picture made from pasting objects or clippings dealing with one subject onto a sheet of paper

ecology - the field which deals with the relations between living organisms and their environment

ecosystem - the system of ecological relationships present within a given community

environment - surroundings

food chain - a series or chain of plants and animals which depend on each other for a food supply; for example, algae → shrimp → fish → man

inversion - a condition in the atmosphere which occurs when a warm layer of air is trapped between two cooler layers of air

life support system - everything needed to maintain life

mapping - making maps; locating objects in relation to a known point

net of interaction - all living things and how they affect one another

noise - unwanted, disagreeable sound or sounds

ppm - parts per million; used to describe the amount of available oxygen in water

pH - how acid or alkali water or soil is

pace - the distance a person travels with each step he takes

plane table - a flat surface on which to draw

pollution - discharge of waste materials which cause adverse and unpleasant effects to water, air, animals, land, and people

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population - all the people living in a certain area; also all the living things in a certain area, such as all the animals in one place

population density - number of people per any given area of land

raw materials - unprocessed materials as they come directly from the land

site - the place where something, such as a town, is located

urban - of, in, or comprising a city or town; not necessarily a large town

web of life - all living things and how they depend upon one another for survival

zoning - dividing the land area of a town or city into sections restricted to specific types of use and construction

SECTION III

GUIDELINES AND RESOURCES FOR EXPLORATION OF NATURAL-RURAL AREAS

Students who have gone through the activities and questions in Sections I and II have a reason for studying natural-rural areas. They need to learn more about the land and the living systems which support human life. We provide in Section III guidelines and resources for studying natural-rural areas in central Oregon.

Further aids for this portion of your total environmental exploration can be found in Everything Around Me; An Environmental Study Guide for Natural-Rural Areas developed by the BLM's Eugene environmental study team during the summer of 1970. Additional field guides are listed in the bibliography.

GUIDELINES

Why Study Natural-Rural Areas.

In their environmental exploration of the town system, your students were exposed to many of the factors which regulate and govern the operation of any community. A number of the concepts involved in the town study can be better understood and made even more meaningful if a knowledge and understanding of natural systems is gained.

Man's dependence upon rural land areas, as explored in The Urban Ecosystem, has furnished the student with a reason for learning more about the lands and natural systems which support his existence. An understanding and awareness of natural systems and relationships often aids us in an understanding of our more complex human systems, and especially of our more complex problems. For example, the understanding of the relation between deer populations, predators, and limited food supply will help the student understand that humans face an identical problem on a much larger scale. Relationships such as these can best be studied on natural areas once the student has an appreciation of how these areas relate to his life.

Large tracts of public lands are available for natural-rural area study. Within the eleven western states alone, the Bureau of Land Management administers some 175 million acres of public domain; the U.S. Forest Service administers about 140 million acres of land; and various other agencies, including the National Park Service, administer smaller amounts. These lands have undergone and are undergoing a variety of resource utilization and conservation programs. Management decisions on public lands have both positive and negative effects, resulting in both short-range and long-range costs and benefits. In the course of their exploration of these areas, the students will evaluate many of the land management decisions and uses currently being practiced. Evaluations of management policies

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should be based upon a thorough understanding of living systems and their complexities.

Where To Study Natural-Rural Areas

Areas which may be used for natural-rural environmental study include extensive holdings of public lands in all portions of the United States. As mentioned earlier, BLM and the U.S. Forest Service administer the largest public land holdings in the country. However, the several other agencies which manage public lands should not be overlooked. The National Park Service has designated certain places in some parks as Environmental Study Areas. Under Resources in this section resource managing agencies are listed which will assist teachers in locating areas for environmental study. If you are unfamiliar with BLM holdings near your town, contact the nearest BLM office. The personnel there will be able to help you determine what areas are available and the most suitable for your purposes. If some guidelines as to what concepts you wish to emphasize are prepared beforehand, the district staff can be of great assistance, and your assurance of success will be increased. A prior knowledge of the site for you, as well as for the students, is important if time spent in the field is to be profitable. If you already have a favorite place or area you are familiar with which you think will help your students better understand the natural-rural environment, by all means use it.

Within the central Oregon region, we have chosen two sites to be used as outdoor laboratories. They are located in BLM's Prineville District (our base during Summer 1970). A brief introduction and description for each site is included and suggestions as to the concepts best emphasized in the outdoors are listed. These are

not the only sites available, but only those we worked with this summer.

BLM Environmental Study Areas - Prineville District

Beavertail Recreation Site

On the Deschutes River eighteen miles downstream from Maupin, Oregon, via the Deschutes River Access Road, is the Beavertail Recreation Site. This site lies on the inside of an oxbow in the Deschutes River Canyon. The area has been fenced off for protection of the recreational facilities. Land outside the enclosure is being heavily grazed and this offers an excellent place to explore the effect of a population upon its environment.

A tremendous number of ecological communities are available for study at the Beavertail site. They range from very wet communities along the river bank through extremely dry, rocky communities on the ridge tops. The transition from wet sites to dry is rapid and easily seen. The presence of a large body of water in a dry land region makes Beavertail a fascinating area for ecological study.

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Chimney Rock Recreation Site

Chimney Rock Recreation Site is twenty miles south of Prineville on State Highway 27 in the Crooked River Canyon; approximately three miles downstream from the Prineville Dam. The area offers exciting opportunities for aquatic study since the students can investigate the direct effects of a dam upon a river. The stream at this location is relatively shallow and slow making it an excellent site for class activities. Studies of aquatic food chains, human uses of water, and fluvial* geologic processes are especially suited for this area.

The geological formations evident in the canyon are also worthy of investigation. Your students may be interested in how and when these structures were formed, what forces shaped them, and how they affect the organisms living there. Before visiting the site, some knowledge of geologic history in the area should be attained.

Because of man's modification and subsequent use of the Crooked River, along with its spectacular geologic formations, Chimney Rock is an exciting area for ecological exploration.

* fluvial - of, or produced by, a river or stream

Environmental Concepts Best Studied On These Sites

In Sections I and II the concepts of: 1) sensory perception; 2) population characteristics and pressure; 3) life support and its limiting factors; and 4) upset of life support systems were explored. These very same conceptual ideas can be investigated in the natural-rural environment.

Explore with your eyes, ears, nose, and occasionally, with caution, your tongue, the environment around you. The diversity is astounding. Explore a dead tree or a rotting log. What plants and animals are living in it and on it? How do you know this? How many organisms can this log support? What determines how much space each of these organisms requires for survival? What happens when these organisms become too crowded? How do they affect the log, their life support system? Is this similar to the effect man has on his life support system? Are these two life support systems the same?

A forest ecosystem, an aquatic ecosystem, or a grassland ecosystem can just as easily be examined through a use of the above concepts as an urban ecosystem can. With a modification of Sections I and II, the same developmental pattern for learning will take place as occurred during urban environmental exploration.

Upon returning to the classroom, a comparison of the controlling environmental factors must be drawn. The dependence of the urban environment upon the rural must be re-emphasized. By understanding how the above listed concepts interact, and how environmental interdependencies relate to his life, the student will achieve a realization of his environmental role.

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RESOURCES

AGENCIES TO CONTACT

Federal Agencies:

Bonneville Power Administration
1002 NE Holladay
Portland, Oregon 97232

Bureau of Land Management
State Office
729 NE Oregon
Portland, Oregon 97232

Bureau of Sport Fisheries and Wildlife
P.O.Box 3737
Portland, Oregon 97208

Bureau of Reclamation
Regional Office
Box 8008
Boise, Idaho 83707

Corps of Engineers
210 Custom House
Portland, Oregon 97209

Federal Water Pollution Control Administration
Northwest Regional Office
Pittock Block
Portland, Oregon

Geological Survey
Conservation Division
830 NE Holladay
Portland, Oregon 97232

National Parks Service
920 NE 7th
Portland, Oregon 97232

U.S. Forest Service
Regional Office
319 SE Pine
Portland, Oregon 97204

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Portland, Oregon 97232

National Parks Service
920 NE 7th
Portland, Oregon 97232

U.S. Forest Service
Regional Office
319 SE Pine
Portland, Oregon 97204

U. S. Soil Conservation Service
State Office
1218 SW Washington
Portland, Oregon 97205

State Agencies:

Oregon State Department of Environmental Quality
1400 SW 5th
Portland, Oregon 97201

Oregon State Fish Commission
1400 SW 5th
Portland, Oregon 97201

Oregon State Game Commission
1634 SW Alder
Portland, Oregon 97205

Oregon State Highway Department
Travel Information Division
Salem, Oregon 97310

Conservation Agencies:

Izaak Walton League
1326 Waukegan Road
Glenview, Illinois 60005

National Audubon Society
1130 5th Avenue
New York, New York 10028

National Wildlife Federation
1412 16th St. NW
Washington, D.C. 20036

Sierra Club
1050 Mills Tower
San Francisco, California 94104

The Wilderness Society
729 15th St. NW
709 Wire Building
Washington, D.C. 20005

U. S. Soil Conservation Service
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1218 SW Washington
Portland, Oregon 97205

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Sierra Club
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San Francisco, California 94104

The Wilderness Society
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709 Wire Building
Washington, D.C. 20005

County Agencies:

- county commissioners
- county agricultural agent
- county assessor
- county health service

City Agencies:

- building bureau
- city hall
- public works division
- water bureau

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BIBLIOGRAPHY

Books

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